

CHAPTER

2

Crime-Scene Investigation and Evidence Collection

Lessons from the Jonbenet Ramsey Case

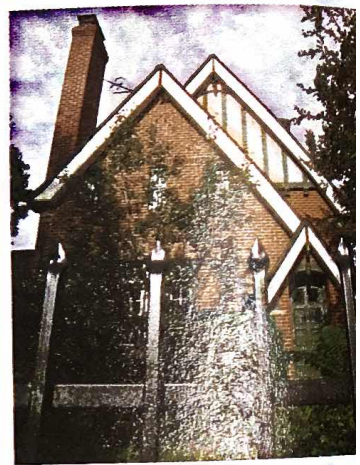
The 1996 homicide investigation of six-year-old JonBenet Ramsey provides valuable lessons in proper crime-scene investigation procedures. From this case, we learn how important it is to secure a crime scene. Key forensic evidence can be lost forever without a secure crime scene.

In the Ramsey case, the police in Boulder, Colorado, allowed extensive contamination of the crime scene. Police first thought JonBenet had been kidnapped because of a ransom note allegedly found by her mother. For this reason, the police did not search the house until seven hours after the family called 911. The first-responding police officer was investigating the alleged kidnapping, so he did not think to open the basement door and did not discover the body of the murdered girl.

Believing the crime was a kidnapping, the police blocked off JonBenet's bedroom with yellow and black crime-scene tape to preserve evidence her kidnapper may have left behind. But they did not seal off the rest of the house, which was also part of the crime scene. The victim's father, John Ramsey, discovered his daughter's body in the basement of the home. He covered her body with a blanket and carried her to the living room. In doing so, he contaminated the crime scene and may have disturbed evidence. That evidence might have identified the killer.

Once the body was found, family, friends, and police officers remained close by. The Ramseys and visitors were allowed to move freely around the house. One friend helped clean the kitchen, wiping down the counters with a spray cleaner—possibly wiping away evidence. Many hours passed before police blocked off the basement room. A pathologist did not examine the body until more than 18 hours after the crime took place.

Officers at this crime scene obviously made serious mistakes that may have resulted in the contamination or destruction of evidence. To this day, the crime remains unsolved. Go to the Gale Forensic Science eCollection for more information on this case.



The Ramsey Home in Boulder, Colorado.

OBJECTIVES

By the end of this chapter, you will be able to:

- 2.1** Summarize Locard's Principle of Exchange.
- 2.2** Identify four examples of trace evidence.
- 2.3** Distinguish between direct and circumstantial evidence.
- 2.4** Identify the types of professionals who might be present at a crime scene.
- 2.5** Summarize the seven steps (seven S's) of a crime-scene investigation.
- 2.6** Explain the importance of securing the crime scene.
- 2.7** Identify the methods by which a crime scene is documented.
- 2.8** Demonstrate proper technique in collecting and packaging trace evidence.
- 2.9** Explain what it means to map a crime scene.
- 2.10** Describe how evidence from a crime scene is analyzed.

TOPICAL SCIENCES KEY

BIOLOGY



CHEMISTRY



EARTH SCIENCES



PHYSICS



LITERACY



MATHEMATICS



VOCABULARY

- **chain of custody** the documented and unbroken transfer of evidence
- **circumstantial evidence** (indirect evidence) evidence used to imply a fact but not support it directly
- **class evidence** material that connects an individual or thing to a certain group (see individual evidence)
- **crime-scene investigation** a multidisciplinary approach in which scientific and legal professionals work together to solve a crime
- **crime-scene reconstruction** a hypothesis of the sequence of events from before the crime was committed through its commission
- **datum point** A permanent, fixed point of reference used in mapping a crime scene
- **direct evidence** evidence that (if authentic) supports an alleged fact of a case
- **first responder** the first safety official to arrive at a crime scene
- **individual evidence** a kind of evidence that identifies a particular person or thing
- **paper bundle** a folded paper used to hold trace evidence
- **primary crime scene** the location where the crime took place
- **secondary crime scene** a location other than the primary crime scene, but that is related to the crime; where evidence is found
- **trace evidence** small but measurable amounts of physical or biological material found at a crime scene
- **triangulation** a mathematical method of estimating positions of objects at a location such as a crime scene, given locations of stationary objects

INTRODUCTION

How is it possible to identify the person who committed a crime? A single hair or clothing fiber can allow a crime to be reconstructed and lead police to the responsible person. The goal of a **crime-scene investigation** is to recognize, document, photograph, and collect evidence at the scene of a crime. Solving the crime depends on piecing together the evidence to form a picture of what happened at the crime scene.

PRINCIPLE OF EXCHANGE Obj. 2.1, 2.2

Whenever two people come into contact with each other or with an object, a physical transfer occurs. Hair, skin cells, clothing fibers, pollen, glass fragments, debris from a person's clothing, makeup, or any number of different types of material can be transferred from one person or object to another. To a forensic examiner, these transferred materials constitute what is called **trace evidence**. Some common examples of trace evidence include:

- Pet hair on clothes or rugs
- Hair on brushes
- Fingerprints on a glass
- Soil tracked into homes or buildings on shoes
- A drop of blood on a T-shirt
- A used facial tissue
- Paint chips
- Broken glass fragments
- A fiber from clothing

The first person to note this was Dr. Edmond Locard, director of the world's first forensic laboratory in Lyon, France. He established several important ideas that are still a part of forensic studies today. **Locard's Principle of Exchange** states that when a person comes into contact with an object or another person, a cross-transfer of physical evidence can occur. The exchanged materials indicate that the two entities were in contact. Trace evidence can be found on both entities because of this cross-transfer. This evidence that is exchanged bears a silent witness to the criminal act. Locard used transfer (trace) evidence from under a female victim's fingernails to help identify her attacker.

The second part of Locard's Principle states that the *intensity*, *duration*, and *nature* of the entities in contact determine the extent of the transfer. For example, more transfer would occur if two individuals engaged in a fistfight than if a person simply brushed past another person. However, exchanges are not always useful evidence. Finding a fingerprint on an object or a hair on a surface does not often provide clues as to *when* the exchange occurred.

TYPES OF EVIDENCE

Obj. 2.3

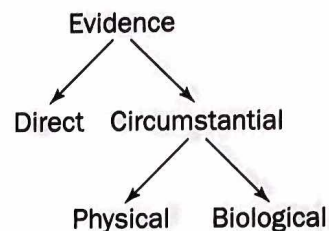
Evidence can be classified into two types: direct evidence and circumstantial evidence (Figure 2-1). **Direct evidence** includes firsthand observations such as eyewitness accounts or police dashboard video cameras. For example, a witness states that she saw a defendant pointing a gun at a victim during a robbery. In court, direct evidence involves testimony by a witness about what that witness personally saw, heard, or did. Confessions are also considered direct evidence.

Circumstantial evidence is indirect evidence that can be used to imply a fact but that does not prove it. No one, other than the suspect and/or victim, actually knows when circumstantial evidence is produced. Circumstantial evidence found at a crime scene may provide a link between a crime scene and a suspect. For example, finding a suspect's gun at the site of a shooting is circumstantial evidence of the suspect's presence there.

Circumstantial evidence can be either physical or biological in nature. Physical evidence includes impressions such as fingerprints, footprints, shoe prints, tire impressions, and tool marks. Physical evidence also includes glass, soil, fibers, weapons, bullets, and shell casings. Biological evidence includes DNA in tissue, bodily fluids, hair, plants, pollen, and natural fibers. Most physical evidence, with the exception of fingerprints, reduces the number of suspects to a specific, smaller group of individuals. Biological evidence such as blood or DNA may make the group of suspects very small. In the case of DNA, it may reduce the group to a single individual, which is more persuasive in court. Trace evidence is a type of circumstantial evidence, examples of which include hair found on a brush, fingerprints on a glass, blood drops on a shirt, and soil tracked into a house (Figure 2-2).

Evidence can also be divided into class evidence and individual evidence. **Class evidence** narrows an identity to a group of persons or things. Knowing the ABO blood type of a sample of blood from a crime scene tells us that one of many persons with that blood type may have been there. It also allows us to exclude anyone with a different blood type. **Individual evidence** narrows an identity to a single person or thing. Individual evidence typically has such a unique combination of characteristics that it could only belong to one person or thing, such as a fingerprint or DNA.

Figure 2-1 Classification of types of evidence.



Did you know

It is relatively easy to recover DNA from cigarette ends found at the scene of a crime.

Figure 2-2 Common examples of trace evidence.

Animal or human hair

Fingerprints

Soil or plant material (including pollen)

Body fluids such as mucus, semen, saliva, or blood

Fiber or debris from clothing

Paint chips, broken glass, or chemicals such as drugs or explosives

EARTH SCIENCES



BIOLOGY



CHEMISTRY



THE CRIME-SCENE INVESTIGATION TEAM Obj. 2.4

Did
you
know

Crime-scene investigation teams do not clean up the scene. This dirty job often falls to the victim's family. Professional crime-scene cleaners can be hired to do this job.

Who is involved in a crime-scene investigation? The team is made up of legal and scientific professionals who work together to solve a crime. Professionals at the scene of a crime may include police officers, detectives, crime-scene investigators, district attorneys, medical examiners, and scientific specialists.

- *Police officers* are usually the first to arrive at a crime scene. They secure the scene and direct activity. A district attorney may be called to the scene to determine whether a search warrant is necessary for the crime-scene investigators.
- *Crime-scene investigators* document the crime scene in detail and collect physical evidence. Crime-scene investigators record the data, sketch the scene, and take photos of the crime scene.
- *Medical examiners* (or coroners) determine the manner of death: *natural, accidental, homicide, suicide, or undetermined.*
- *Detectives* interview witnesses and talk to the crime-scene investigators about the evidence.
- *Specialists* such as entomologists (insect biologists), forensic scientists, and forensic psychologists may be consulted if the evidence requires their expertise.

CAPSTONE ACTIVITY

#10 "Gravesite
Excavation"

THE SEVEN S'S OF CRIME-SCENE INVESTIGATION

Obj. 2.5, 2.6, 2.7, 2.8

Securing the Scene

Securing the scene is the responsibility of the first-responding law-enforcement officer (**first responder**). The safety of all individuals in the area is the first priority. Preservation of evidence is the second priority. This means the officer protects the area within which the crime has occurred, restricting all unauthorized persons from entering. Transfer, loss, or contamination of evidence can occur if the area is left unsecured (Locard's Principle of Exchange). The first officer on the scene keeps a security log of all those who visit the crime scene. The officer collects pertinent information and requests any additional requirements for the investigation. He or she may ask for more officers to secure the area. Depending on the nature of the crime, the first-responding officer may request various teams of experts to be sent to the crime scene.

Separating the Witnesses

Separating the witnesses is the next priority. Witnesses must not be allowed to talk to each other. Crime-scene investigators will compare the witnesses' accounts of the events. Witnesses are separated so they do not work together to create a story (collusion).

The following questions need to be asked of each witness:

- When did the crime occur?
- Who notified law enforcement?
- Who is the victim?
- Can the perpetrator be identified?
- What did you see happen?
- Where were you when you observed the crime scene?

Scanning the Scene

The forensic crime-scene examiners first need to scan the scene to determine where photos should be taken. A determination may be made of a primary crime scene and secondary crime scene and priorities assigned regarding examination. (The location of the crime is the **primary crime scene**. If movement to a new location occurs, that location is considered a **secondary crime scene**.) A robbery in front of a store might be the primary scene, and the home of a suspect might be the secondary scene. A murder may have taken place at one location (primary scene) and the body found at another (secondary scene).

Seeing the Scene

The crime-scene examiner needs to see the scene. Photos of the overall area and close-up photos with and without a measuring ruler should be taken. *Triangulation* should be included in the photos. **Triangulation** is a mathematical method of calculating the location of an object from the locations of other objects. Close-ups and photos from varying distances of any evidence and remains should be taken.



► Theodolite

Sketching the Scene

A crime-scene investigator eventually makes an accurate sketch of the crime scene, noting the position of the remains (if any) and any other evidence. (You can see a reduced sketch form in Figure 2-3.) All objects should be

A large rectangular box representing a sketch form. In the top-left corner, there is a north arrow pointing towards the top-left, with the letter 'N' next to it. In the bottom-right corner, there are two stacked rectangular boxes. The top box contains the text 'Scale: 1/4" = _____ feet'. The bottom box contains four lines of text: 'Case number _____', 'Date _____', 'Location _____', and 'Name _____'.

Figure 2-3 A reduced blank crime-scene sketch form showing the information that must be provided with the sketch.

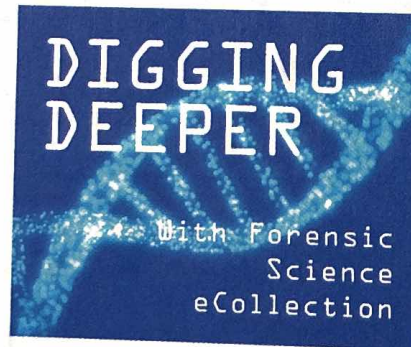
Searching for Evidence

Figure 2-4 *Four crime-scene search patterns.*



Research how thermal imaging helped to locate the alleged Boston Marathon bomber.

All evidence should be photographed, sketched, labeled, and documented. Additional light sources such as flashlights or black lights are used to locate hair, fibers, or body fluids. New technologies, including thermal and satellite imaging and ground-penetrating radar, can be used to help locate remains



DIGGING DEEPER

With Forensic Science eCollection

What happened to Natalee Holloway in Aruba in 2005? This is an unsolved case in which questions have been raised about why crime-scene investigators have not been able to find her body. In fact, investigators searched the island with an array of cutting-edge tools, from a remote-controlled submersible equipped with a video camera and sonar used for probing the water under bridges and in lagoons, to telescoping rods tipped with infrared sensors and cameras used for searching beneath manhole covers and into shadowy caverns. Go to the Gale Forensic Science eCollection on ngl.cengage.com/forensicscience2e and research the case. Conduct your own investigation by reading the primary sources available on the Website. Write a brief explanation that summarizes the forensic tools used to find Holloway's body and any evidence that was discovered during the search.

and other evidence. Thermal imaging helped law-enforcement teams pinpoint the location of the Boston Marathon bombing suspect in April 2013 (Figure 2-5).

Securing and Collecting Evidence

All evidence needs to be properly packaged, sealed, and labeled. Specific procedures and techniques for evidence collection and storage must be followed. Liquids and arson remains are stored in airtight, unbreakable containers. Moist biological evidence is stored in breathable containers so the evidence can dry out, reducing the chance of mold contamination. After the evidence is allowed to air dry, it is packaged in a **paper bundle**. The bundle (also called a druggist's fold) can then be placed in a plastic or paper container. This outer container is then sealed with tape and labeled with the signature of the collector written across the tape. An evidence log and a **chain of custody** document must be attached to the evidence container.

The evidence log should contain all pertinent information, including:

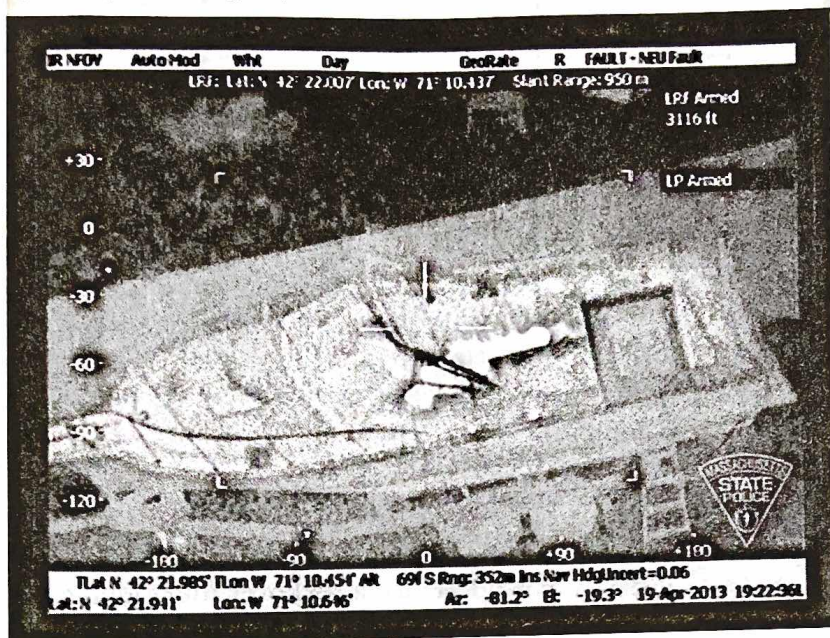
- Case number
- Item inventory number
- Description of the evidence
- Name of suspect
- Name of victim
- Date and time of recovery
- Signature of person recovering the evidence
- Signature of any witnesses present during collection

PACKAGING EVIDENCE

The paper bundle is ideal packaging for small, dry, trace evidence. The size of the bundle depends on the size of the evidence. If the evidence is small, the bundle can be constructed from a sheet of paper. If the evidence is large, the bundle might be constructed from a large sheet of wrapping paper. The packaging techniques are shown in Figure 2-6 on the next page. The steps are as follows:

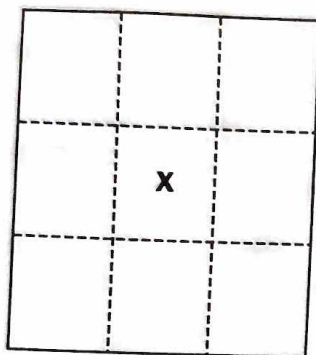
1. Choose the appropriate-size sheet of clean paper for the bundle.
2. Crease the paper as shown.
3. Place evidence in the location shown by the X.
4. Fold the left and right sides in.
5. Fold in the top and bottom.

Figure 2-5 Thermal image of the alleged Boston Marathon bomber, Dzhokhar Tsarnaev, hiding in a boat just before being captured.



Handout/Getty Images

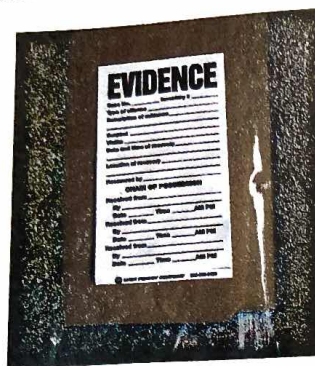
Figure 2-6 Demonstration of packaging of dry evidence.



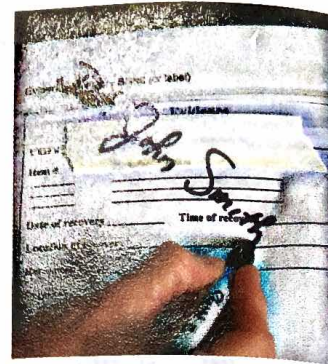
a. Placement of evidence.



b. Place dried evidence on bindle paper.



c. Secure bindle in labeled evidence bag using stick-on label.



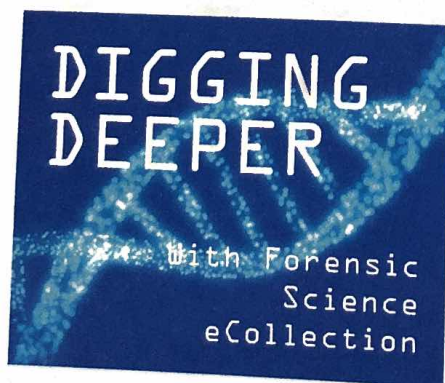
d. Write the collector's signature across the bag's taped edge.

6. Insert the top flap into the bottom flap; then tape the bindle closed.
7. Place the bindle inside a plastic or paper evidence bag. Fold the bag closed.
8. Place a seal over the folded edge of the evidence bag.
9. Have the collector write his or her name over the folded edge.

If a wet object to be packaged is large, it should be placed in a paper container and sealed to allow it to air dry. Wet evidence should never be packaged in a plastic container while wet. Any DNA present will degrade and evidence may become moldy and useless.

There are standards for collecting different types of evidence that describe how to collect and store the evidence. The Federal Bureau of Investigation and state police agencies publish descriptions of the proper procedures.

Control samples, including hair and fibers, must also be obtained from the victim for the purpose of exclusion. For example, blood samples found on a victim or at a crime scene are compared with the victim's blood.



O.J. Simpson was tried and acquitted for the murder of his ex-wife Nicole Brown Simpson and her friend Ronald Goldman in 1994. The O.J. Simpson murder trial is often cited as a classic example of how crucial evidence was lost, altered, or contaminated. Go to the Gale Forensic Science eCollection

on ngl.cengage.com/forensicscience2e and research the case. Cite specific examples of how evidence was damaged, lost, or contaminated by crime-scene personnel. Write a brief explanation summarizing your findings, making sure to back up your argument with reliable sources for which you cite dates of the publications.

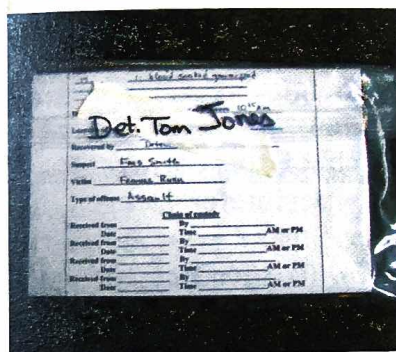
If they match, the samples are excluded from further study. If the blood samples do not match, then they may have come from the perpetrator and will be further examined.

CHAIN OF CUSTODY

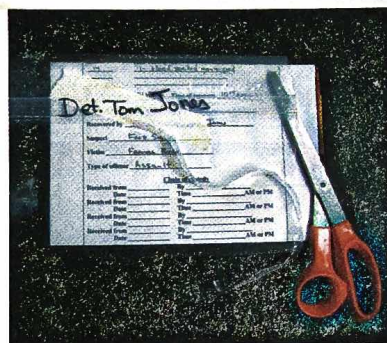
In securing the evidence, maintaining the chain of custody is essential. The individual who finds evidence bags the evidence in a plastic or paper container. The final container for the evidence is a collection bag or box, which is labeled with the pertinent information. The container is then sealed, and the collector's signature is written across the sealed edge.

The container is given to the next person. That person takes it to the lab and signs it over to a technician, who opens the package at a location other than the sealed edge. On completion of the examination, the technician repackages the evidence in its original packaging, inserts and reseals the evidence in new packaging, and signs the chain-of-custody log attached to the packaging. This process ensures tracking of the evidence as it passes from the crime scene to a courtroom (Figure 2-7).

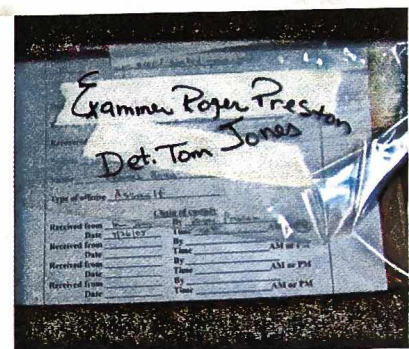
Figure 2-7 Chain-of-custody procedures.



a. Original evidence bag.



b. Opened evidence bag maintaining signature on first seal.



c. Original evidence bag with uncut seal and signature, updated chain-of-custody log in a new sealed and signed evidence bag.

Mapping the Outdoor Crime Scene

In establishing an area around a crime scene for outdoor evidence collection, use either a triangular, square, or rectangular region surrounding the evidence (Figure 2-8). All evidence should be accurately documented as to its precise location.

DATUM POINTS AND SUBDATUM POINTS

If possible, establish a **datum point**, a permanent, fixed point of reference such as a corner of a building or a tree. Measurements and directions can be established from the datum point to a corner stake of your crime scene marking the *subdatum point*. Use a piece of rebar or wooden stake pounded into

Figure 2-8 Establishing a crime scene.



the ground at the corner of your crime scene as your subdatum point. The rebar can later be located using a metal detector. Any evidence collected will be measured from this subdatum point using two tape measures and a compass.

Pound the rebar or stake into the ground at the north corner of your crime scene at least 1 meter away from any evidence. This marks the first corner (subdatum) of your crime scene. The rebar is used and left in the ground so the crime scene can be revisited.

Using a compass, establish a north-south baseline from this first corner. Run a measuring tape from the rebar located in the first corner (northern end) along this north-south baseline extending the tape measure at least one meter beyond any evidence. Put in a stake at this second corner subdatum (located along the south end of your north-south baseline). Record the distance of this north-south baseline to stake 2.

MATHEMATICS



MARKING EVIDENCE COLLECTING LIMITS

From the first north corner, stake 1, use a compass to form a second line located at 90 degrees east of the first corner. Extend the metered tape at least 1 meter beyond your evidence. Put in a stake into this third corner, 3. Record

the length of this second line. Position stake 4 so that a rectangle (or square) is formed around the evidence. Be sure all corners are right angles (see Figure 2-9).

Ensure that you have formed right angles (90 degrees) at each of the corners. Using your north-south perimeter length (a) (corner 1 to corner 2) and your north-east perimeter length (b), (corner 1 to corner 3), calculate the hypotenuse (c) of the right triangle formed by these two sides. Recall the Pythagorean theorem, $a^2 + b^2 = c^2$, where a and b are the congruent sides of a right triangle, and c is the hypotenuse, the side that connects them. For example, if your north-

south baseline (a) was equal to 3 meters, and your second north-east line (b) was equal to 4 meters, then the length of your hypotenuse (c) would be 5 meters ($3^2 + 4^2 = c^2$) or ($9 + 16 = c^2$). The square root of 25 is 5, so your hypotenuse is 5.

If you tie a string around corner 3 (northeast corner) equal to the length of your calculated hypotenuse and extend it to corner 2 (southwest corner), it should connect to corner 2. If the string (your hypotenuse) is either too long or too short, then your corners are not 90 degrees. If they are not, go back and check your compass settings are 90 degrees. The length of your calculated hypotenuse should fit the distance between corner 3 and corner 2. Use the same procedure to check the other sides of your rectangle.

MEASURING AND MARKING EVIDENCE POSITIONS

The location of any evidence is measured by the perpendicular distances from the evidence to the two reference lines along the perimeter of your rectangle (Figure 2-10). For example, the distance could be measured from the perpendicular distance from the north-south baseline and the

Figure 2-9 Evidence collecting limits.

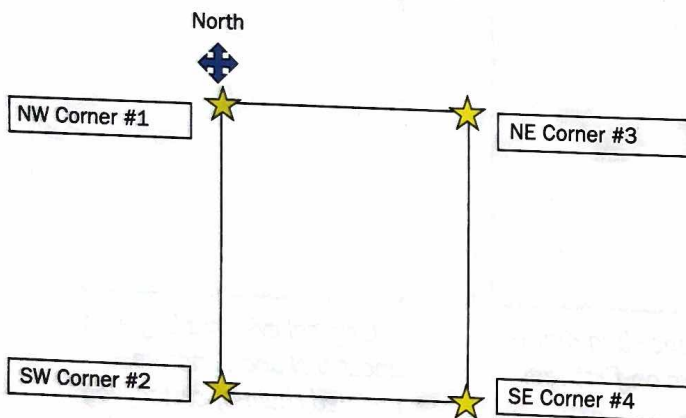
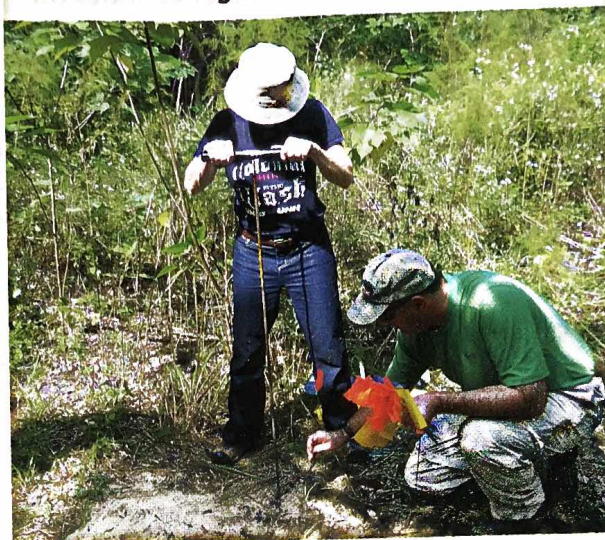


Figure 2-10 *Measuring the position of evidence.*



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Figure 2-11 *Probing a collection site for evidence belowground.*



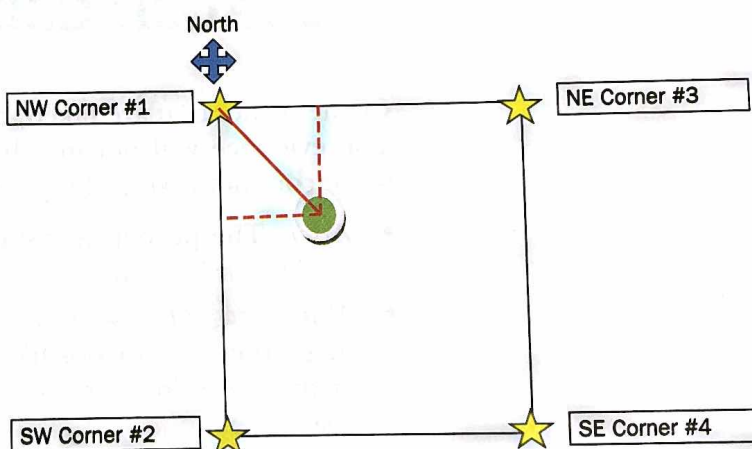
© Cengage Learning

perpendicular measurement from your east-west line. You can also cite the compass heading of the evidence taken from the rebar stake or subdatum point in corner 1 to validate the position of the evidence.

To express locations of evidence above or below the ground (Figure 2-11), use the ground as your baseline. Express distances aboveground as positive numbers and distances belowground as negative numbers.

Refer to Figure 2-12. The evidence location (green dot) could be noted as 2 meters from the north line and 2 meters from the west line. The compass heading from subdatum corner 1 is 45 degrees.

Figure 2-12 *Establishing the location of evidence at the collection site.*



ANALYZE THE EVIDENCE Obj. 2.9

Following crime-scene processing, the forensic laboratory work begins (Figure 2-13). A forensic lab processes all of the evidence processed at the crime-scene. Unlike the characters on CSI television programs, forensic lab technicians are specialized and process only one type of evidence.

The laboratory results are sent to the lead detective. The detective looks at the evidence and attempts to determine how it fits into the overall crime scenario. The evidence is examined and compared with the witnesses' statements to help determine the reliability of their accounts. Evidence analysis can link a suspect with a scene or a victim, establish the identity of a victim or suspect, confirm verbal witness testimony, or acquit the innocent. Investigators must consider

Figure 2-13 *A modern forensics laboratory.*



Dean Gojia/Getty Images

all possible interpretations of the evidence. Direct evidence is more convincing than circumstantial evidence. During legal proceedings, in the process of discovery, all information in the possession of the prosecution must be shared with the defense.

CAPSTONE ACTIVITY

#3 "How Reliable Is the Evidence?"

#4 "Landmark Cases in Acceptance of Evidence"

CRIME-SCENE RECONSTRUCTION

Crime-scene reconstruction involves forming a hypothesis of the sequence of events from before the crime was committed through its commission. The evidence is examined and compared with the witnesses' statements to help determine the reliability of their accounts. The investigator looks at the evidence and attempts to determine how it fits into the overall crime scenario. The evidence does not lie, but it could have been staged. It is important that investigators maintain an open mind as they examine all possibilities.

STAGED CRIME SCENES

Crime scenes that are faked, or *staged*, by criminals pose a unique problem. The evidence will not match the testimony of witnesses. Here is a list of some commonly staged types of crime scenes:

- **Arson.** The perpetrator stages a fire to cover some other crime such as murder or burglary.
- **Murder staged to look like suicide.** A victim is murdered, and the perpetrator stages the scene to look like a suicide. The death may be caused by alcohol or drug overdose, or it may be caused by violence. The motive could be insurance money, release from an unhappy marriage, or simply robbery.
- **Burglary.** A burglary may be staged to collect insurance money.

In the determination of whether a crime scene is staged, the following points should be considered:

- Initially treat all death investigations as homicides.
- Are the type(s) of wounds on the victim consistent with the suspected weapon employed?
- Could the wounds be easily self-inflicted?
- Establish a profile of the victim through interviews with friends and family.
- Evaluate the behavior (mood and actions) of the victim before the event.
- Evaluate the behavior (mood and actions) of any suspects before the event.
- Corroborate statements with evidential facts.
- Reconstruct the event.

CASE STUDIES

Lillian Oetting (1960)

Three Chicago socialites were murdered in Starved Rock State Park, Illinois. All three women had fractured skulls. Their bodies, bound with twine, were found in a cave. Near the bodies of the women, a bloodied tree limb was found and considered to be the murder weapon. Because all three women had been staying at a nearby lodge, the members of the lodge staff were questioned. Chester Weger, a 21-year-old dishwasher at the lodge, was asked about a blood stain on his coat. He said it was animal blood. He agreed to take a lie detector test and passed it. He was requestioned and took a second lie detector test and passed it as well. The blood was examined by the state crime lab and found to be animal blood as Weger had indicated at questioning. The case reached a dead end.

Investigators decided to revisit the evidence. The rope used to bind the women was examined more carefully. It was found to be 20-stranded twine sold only at Starved Rock State Park. Twine consistent with that used in the crimes was found in an area accessible to Weger. He again became a prime suspect. The blood on his coat was reexamined by the FBI Crime Lab and found to be human and compatible with the blood of one of the victims. Weger submitted to another lie detector test and failed it. Weger was found guilty for the murder of one of the women, Lillian Oetting, and has spent more than 50 years in prison. He recently petitioned the Governor of Illinois for clemency, saying he was beaten and tortured into making the confession. He still maintains his innocence.

The Atlanta Child Murders (1979–1981)

Wayne Williams is thought to be one of the worst serial killers of adolescents in U.S. history. His victims were killed and thrown into the Chattahoochee River in Georgia. Williams was questioned because he was seen close to where a body had washed ashore. Two kinds of fiber were found on the victims. The first kind was an unusual yellow-green nylon fiber used in floor carpeting. Through the efforts of the FBI and DuPont Chemical Company, the carpet manufacturer was identified. The carpet had been sold in only 10 states, one of them being Alabama, where Williams lived. The fibers found on the victims were linked to carpet fibers found in Williams' home.

Another victim's body yielded the second type of fiber. This fiber was determined to be from carpeting found in pre-1973 Chevrolets. It was determined that only 680 vehicles registered in Alabama had a matching carpet. Williams owned a 1970 Chevrolet station wagon with matching carpet. Williams was convicted and sentenced to two life terms.

Think
Critically



Review the Case Studies and the information on investigating crime scenes in the chapter. Explain how evidence obtained at a crime scene is crucial to solving a case.

Multiple Choice

1. Locard's Principle of Exchange implies all of the following except *Obj. 2.1*
 - a) Fibers can be transferred from one person to another.
 - b) Blood spatter can be used to identify blood type.
 - c) Cat hair can be transferred to your pants.
 - d) Soil samples can be carried from the yard into your home.
2. The reason it is important to separate the witnesses at the crime scene is to *Obj. 2.5, 2.6*
 - a) prevent contamination of the evidence
 - b) prevent fighting among the witnesses
 - c) prevent the witnesses from talking to each other
 - d) protect them from the perpetrator
3. Correct collection of evidence requires which of the following? *Obj. 2.8*
 - a) documenting the location where the evidence was found
 - b) correct packaging of evidence
 - c) maintaining proper chain of custody
 - d) all of the above
4. A crime-scene sketch should include all of the following except *Obj. 2.5, 2.7*
 - a) a distance scale
 - b) date and location of the crime scene
 - c) a north heading
 - d) the type of search pattern used to collect the evidence

Short Answer

5. Blood type is considered to be class evidence. Although it may not specifically identify the suspect, explain how it still could be useful in helping to investigate a crime. *Obj. 2.3*
6. The recorder at the crime scene needs to work with all of the police personnel at the crime scene. What type of information would the recorder need to obtain from each of the following persons? *Obj. 2.4, 2.7*
 - a) first-responding officer
 - b) photographer
 - c) sketch artist
 - d) evidence collection team
7. When the crime-scene investigators arrive at a potential homicide scene, one of their duties is to collect evidence from the victim's body. However, some evidence needs to be collected from the body at a later time in the morgue. For each type of situation listed, describe the type(s) of evidence that could be obtained by: *Obj. 2.6, 2.7, 2.8, 2.9*
 - a) transporting the body in a closed body bag
 - b) taking nail clippings from the deceased
 - c) placing a plastic bag over the hands of the deceased before transporting the person's body to the morgue
 - d) brushing the clothing of the victim with a clothes brush

8. Identify the errors in each of the following cases: *Obj. 2.5, 2.7, 2.8, 2.9*

Case 1

A dead body and a gun were found in a small room. The room was empty except for a small desk and a chair. The room had two windows, a closet, and a door leading into a hallway. The crime-scene sketch artist measured the perimeter of the room and drew the walls to scale. He sketched the approximate position of the dead body and the gun. He sketched the approximate location of the chair and the desk. What did he forget to do?

Case 2

At the scene of the crime, the evidence collector found a damp, bloody shirt. The evidence collector quickly wrapped the shirt in a paper bindle. He inserted the paper bindle with the shirt into an evidence bag. The bag was sealed with tape, and the collector wrote his name across the tape. The CSI also picked up three cigarette butts and put them into a plastic evidence bag, which he sealed and labeled. An evidence collection log was completed and taped to each of the evidence bags. What did he do incorrectly?

Case 3

Several different labs often need to share a small amount of evidence. It is important that the chain of custody be maintained. If the chain of custody is broken, then the evidence may not be allowed in a court proceeding. Identify the break in the following chain of custody.

After obtaining evidence, a lab technician removed the tape that contained the signature of the crime-scene evidence collector. Upon completion of her examination of the evidence, the lab technician put the evidence back into a paper bindle, and inserted the bindle into an evidence bag. The technician resealed the bag in the same place as the original crime-scene investigator. After carefully sealing the bag, the lab technician signed her name across the tape. She completed the chain-of-custody form on the outside of the evidence bag and brought the evidence to the next lab technician at the crime lab.

9. Analyze the JonBenet Ramsey case described in the beginning of the chapter.
 - a) The crime-scene investigators who first arrived at the scene had a pre-conceived idea that JonBenet was kidnapped. Describe how important evidence may have been lost or destroyed because they assumed they were investigating a kidnapping as opposed to a murder. *Obj. 2.5, 2.6*
 - b) Describe how the father's actions upon finding the body resulted in a loss of evidence and/or contamination of the evidence. *Obj. 2.6*
10. Refer to the case study of the Atlanta Child Murders as you answer the following questions.
 - a) Describe the direct evidence linking Wayne Williams to the crimes. *Obj. 2.2, 2.3*
 - b) What type of circumstantial evidence linked Wayne Williams to the crimes? *Obj. 2.2, 2.3*
 - c) Using specific examples from the Wayne Williams case, explain how crime-scene investigations can use information obtained from manufacturers when evaluating evidence. *Obj. 2.9*